

REMARKS

Claims 1, 4-24 and 27-28 continue to appear in this application for the Examiner's review and consideration. Claims 2-3 are currently withdrawn. Minor changes have been made to claims 4 and 5. The allowance of claims 27-28 is appreciated. Claim 27 has been amended to clarify that the purpose of the second glassy layer is not to relax the stressed layer; instead it is more to protect the stressed layer (see page 19, line 9-12; also page 19, line 29 to page 20, line 2) while also being removable (for instance, by sacrificial oxidation as described on page 20, lines 2-7) so that a layer of semiconductor material can be grown on the surface layer that remains to provide a stressed surface layer in the structure. Applicants believe that claim 27 and dependent claim 28 remain in condition for allowance with these changes. In view of the following remarks, it is believed that claims 1-24 are also in condition for allowance.

An error of a typographical nature was identified in the paragraph bridging pages 18-19. In particular, the third sentence incorrectly stated that the surface layer was heated to become viscous to allow the stressed layer to relax, when it should have stated that it is the glassy layer that does this. Accordingly, this change was made to correct that paragraph. Support for the change can be found throughout the application, such as the paragraph bridging pages 9-10. It is the heating of the glassy layer to its viscosity temperature that caused that layer to become viscous and reduce stresses in the adjacent stressed layer. As no new matter has been introduced, this change should be entered.

Claims 1 and 4-24 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement for the reasons set forth on pages 2-3 of the action. Basically, the office action states that the specification does not provide any guidance as to how heat treating a structure that includes the glassy layer, the stressed layer and the surface layer would relax the stressed layer. Applicants traverse the rejection.

It is known in the art that a layer is "relaxed" if its crystalline material has a lattice parameter that is substantially identical to the nominal lattice parameter of the material is in its bulk equilibrium form. It is also known that a layer is "strained" if its crystalline material is elastically stressed in tension or in compression during crystal growth, such as during epitaxy, this results in its lattice parameter being substantially different from its nominal lattice parameter and imparting strain into the material. The specification teaches that the material making up the glassy layer becomes viscous when a viscosity temperature TG is reached. Thus, by forming a glassy layer in the structure and then by heating the

structure to the viscosity temperature, the glassy layer becomes viscous and relaxes the stress on the stressed layer.

While the exact mechanism of this feature is not completely understood, it is in agreement with that disclosed by Hobart et al. in the article entitled "Compliant Substrates: A comparative study of the relaxation mechanisms of strained films bonded to high and low viscosity" (Journal of Electronic Materials, vol.29, No.7, 2000) as mentioned in the background of the present specification. Hobart et al. discloses that the application of a heat treatment causes relaxing or pseudo-relaxing a layer of stressed SiGe when that layer is bonded to a BPSG glass during the bonding step. During the heat treatment, the stressed layer thus seems to relax via the layer of glass which has become viscous due to the temperature of the heat treatment.

Furthermore, the following passages do provide guidance on :

- how to form the glassy layer 4 : page 9, line 28 to page 12, line 12; and
- heat treating the glassy layer : page 18, line 27 to page 19, line 12.

To the extent that the current rejection is based on the typographical error in the paragraph bridging pages 18-19, or to the language that previously appeared in claim 27, those now have been corrected for clarity and to avoid any confusion on this point.

Other portions of the specification teach different ways for transforming the first or second glassy layer to make that layer viscous in order to reduce stress in the stressed layer. In particular, the heating temperatures necessary for rendering the glassy layer viscous are explicitly disclosed. In general, heating to at least the viscosity temperature of the glassy layer will produce the necessary viscous nature of that layer (see paragraph bridging pages 5-6 of the application), while, in particular, heating to a minimum temperature of 1050 to 1200°C for between several seconds to several hours will achieve the desired relaxation of the stressed layer (See second full paragraph on page 18). Since the application discloses the steps to be conducted to assemble the structure with particularly defined layers and to heat treat the structure in a manner to achieve such relaxation of the stressed layer, the written description requirements have been met for claim 1.

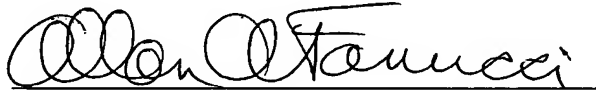
The same is true for the embodiment of the invention wherein a second glassy layer is used as a surface layer to protect the stressed layer that is beneath it. As noted in the paragraph bridging pages 17-18, the first full paragraph on page 18 and Figure 1f, the stressed layer can be protected by a surface layer, and this layer can be converted into a second glassy layer that is removable so that a layer of semiconductor material can be grown on the surface layer that remains to provide a stressed surface layer in the structure.

Accordingly, the written description rejection has been overcome and should be withdrawn. Thus, the entire application is now believed to be in condition for allowance, early notice of which would be appreciated. Should the Examiner not agree, then a personal or telephonic interview is respectfully requested to discuss any remaining issues in order to expedite the eventual allowance of this application.

Date: _____

5/19/05

Respectfully submitted,



Allan A. Fanucci (Reg. No. 30,256)

WINSTON & STRAWN

CUSTOMER NO. 28765

(212) 294-3311